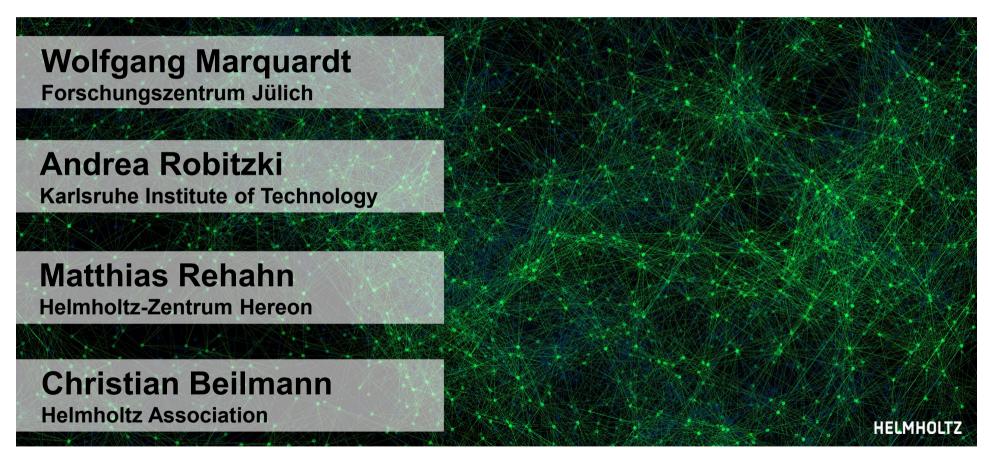






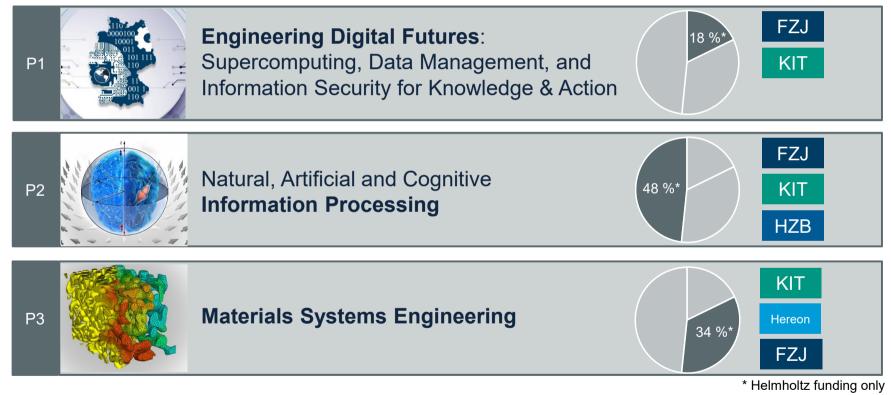


MSE Day 18.11.2022 Opening



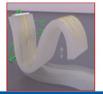
Program MSE

Research Field Information (PoF IV: 2021 – 2027)



Program MSE

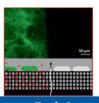
3 Research Centers, 5 Topics



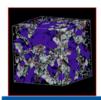
Topic 1
Functionality by
Information-Guided
Design: From
Molecular Concepts
to Materials



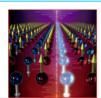
Topic 2
Optics & Photonics:
Materials, Devices,
and Systems



Topic 3Adaptive and
Bioinstructive
Materials Systems



Topic 4
Scale-Bridging
Designed Materials:
From Fundamentals to
Systems



Topic 5

Materials
Information
Discovery













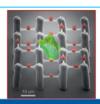




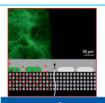
Program MSE Topic-Spokespersons



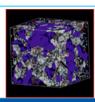
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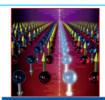
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Topic 5

Materials
Information
Discovery



Jasmin Aghassi-Hagmann KIT



Martin Wegener KIT



Christof Niemeyer KIT



Regine Willumeit-Römer Hereon



Joachim Mayer FZJ



Manfred Gossen Hereon



Thomas Klassen Hereon



Christof Wöll KIT



Thomas Hanemann KIT



Jan G. Korvink KIT

Program MSE New Professors in Program MSE at KIT



Prof. Stefanie Dehnen
Institute of Nanotechnology
Information-Based Material Design and Nanosciences
MSE Research Focus: High-Entropy Cluster-Based Materials



Prof. Frank Simon
Institute for Data Processing and Electronics
Data Processing and Electronics
MSE Research Focus: Optical Data Transmission with Silicon Photonics

MSE Day 2022 Agenda

09:20 – 09:25 Introduction: Program Materials Science Engineering (MSE)

Christof Wöll (Program Spokesperson MSE, KIT)

09:25 – 9:30 Announcement: MSE Collaboration Challenge for Young Scientists

Regine Willumeit-Römer (Hereon)

09:30 - 10:30 MSE Cross-sectional Research I

Collaborations: cross-linking topics, centers, programs

09:30 – 09:50 Eloho Okotete (KIT): Characterizing the Interface Toughness in Functional Material Systems

09:50 – 10:10 Hongrong Hu (KIT): Printed Electronic Devices and Circuits

 $10: 10-10: 30 \quad \hbox{G\"{o}zde Kabay (KIT): From Bioinspired Materials to Personalized Biomedical}$

Technologies

10:30 - 10:50 Coffee Break / Poster Session

10:50 - 11:30 MSE Cross-sectional Research II

10:50 – 11:10 Sumi Jo (Hereon): Improving the Forming Behavior and Precipitation Hardness of the Ductile Magnesium Alloy ZAX210 by TRC

11:10 – 11:30 Andras Kovacs (FZJ): Correlative Chracterisation of Magnetic Nanostructures using Transmission Electron Microscopy

11:30 - 11:50 ELN Concept MSE

Susan Anson (KIT)

11:50 - 14:00 Lunch / Poster Session

7 HELMHOLTZ

MSE Day 2022 Agenda

14:00 - 15:00 Joint Lab Presentations

14:00 - 14:30 JL VMD

Roland Aydin (Hereon): Machine Learning for Digital Twins in Virtual Materials Design Markus Nyman (KIT): A Digital Twin in the Context of Photonic Material Design

14:30 - 15:00 JL MDMC

Richard Thelen (KIT): The Long and Winding Road. News from the Metadata Working Group.

Jan Reimers (FZJ): Correlative Imaging of Biodegradable Mg-based Alloys Using *in situ*

SRnanoCT and Electron Microscopy Techniques

15:00 - 16:00 Knowledge and Technology Transfer

Support, challenges, success stories

Jan-Niklas Blötz (KIT): Innovation Management at KIT

Kersten Rabe (KIT): Translating Science into Business and Society

Michael Hirtz (KIT): Knowledge Transfer & Innovation – Different Ways from Lab to Fab

16:00 - 16:15 Coffee Break / Poster Session

16:15 - 16:30 MSE Collaboration Challenge for Young Scientists

Presentation of most interesting proposals nominated by young scientists

16:30 - 16:45 Wrap up and Outlook

Christof Wöll, Joachim Mayer

Following:

Digital Poster Session / Small Groups: Discussion of Collaborations

Please join the

Digital Poster Session

17:00 - ca. 18:00

Bus departure

17:00 to Karlsruhe Main Station

18:00 to Karlsruhe Main Station





JOINT LAB
Integrated Model and Data Driven
Material Characterization









787. WE-Heraeus-Seminar

Accelerated Discovery of New Materials



15 May - 18 May 2023, Physikzentrum Bad Honnef

The development of new materials is critical for all industrialized societies, as it touches upon virtually all technology relevant application fields including energy, efficient use of resources and devices for information technologies.

One of the major challenges in this field is the sheer number of conceivable materials, which is far more than can ever be experimentally realized and characterized. Digitalization strategies for materials research, which blend advanced computational approaches with sophisticated experimental techniques, offer a way forward. Traditional trial and error research needs to be replaced by computer-based simulations carried out in parallel with novel experimental processes. In this seminar, we will put a main - but not exclusive - focus on two novel classes of materials: "high entropy alloys" (HEA) and "metal organic frameworks" (MOFs). HEAs are alloys with roughly equal proportions of five or more elements, yielding e.g. mechanical properties that are often substantially different from conventional alloys. HEA oxides display interesting properties in



catalysis and energy storage. MOFs are porous, crystalline compounds where organic linkers connect metal nodes. Originally developed for gas storage and separation, recently MOFs have found widespread applications in optoelectronics and sensorics. We will also not exclude other materials - in particular perovskites and battery materials.

The program will include a series of lectures by leading researchers from experiment, theory, and computer science. Students and early career researchers are encouraged to participate with posters and flash presentations. To facilitate trans- and interdisciplinary exchange we will hold open discussion sessions on a variety of topics.

Invited speakers

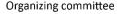
Silvana Botti, Universität Jena Christoph Brabec, Universität Erlangen Andy Cooper, University of Liverpool (TBC) Claudia Draxl, Humboldt-Universität zu Berlin Pascal Friederich, Karlsruher Institut für Technologie Axel Groß, Universität Ulm Seda Keskin, Koc University Istanbul Giorgio Sangiovanni, Universität Würzburg Berend Smit. École Polytechnique Fédérale de Lausanne

Helge Stein, Helmholtz-Institut Ulm Manuel Tsotsalas, Karlsruher Institut für Technologie Wolfgang Wenzel, Karlsruher Institut für Technologie Regine Willumeit-Römer, Helmholtz-Zentrum Hereon, Geesthacht

Application

All participants except invited speakers must apply at www.we-heraeus-stiftung.de/veranstaltungen/ accelerated-discovery-of-new-materials before March 12, 2023.

Complimentary on-site and full-board accommodation is provided by the Wilhelm and Else Heraeus Foundation, and there is no conference fee.



Christof Wöll, Karlsruher Institut für Technologie Martin Aeschlimann, Technische Universität Kaiserslautern Roser Valentí. Goethe-Universität Frankfurt am Main



The organizers are supported by FAIRmat and the Helmholtz Program Materials Systems Engineering

